

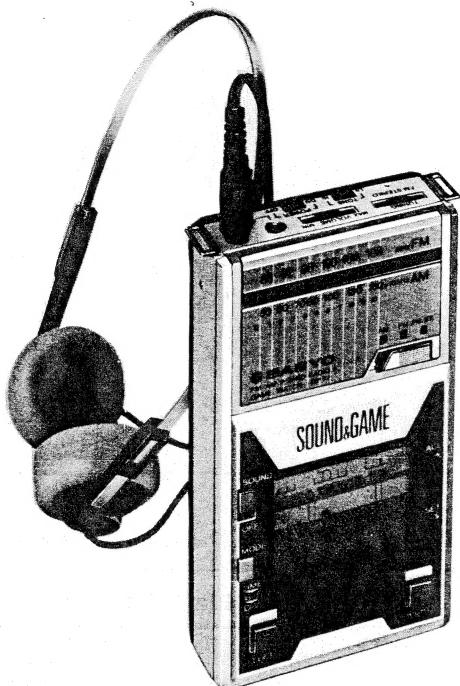
# SERVICE MANUAL

## FM/AM PORTABLE RADIO



12  
**SANYO**

**RP77**



### SPECIFICATIONS

|                             |  |
|-----------------------------|--|
| Frequency range:            | AM: 525 — 1605 kHz<br>FM: 88 — 108 MHz |
| Intermediate frequency:     | AM: 455 kHz,<br>FM: 10.7 MHz           |
| IC: (Part of Radio)         | 2                                      |
| Transistor: (Part of Radio) | 10 (FET x 1)                           |
| Diode: (Part of Radio)      | 10 (LED x 1)                           |
| Sensitivity:<br>(for 1mW)   | AM 500µV/m<br>FM 10µV(S/N=30 dB)       |
| Power source:               | DC 4.5V 3 "AA" cells                   |
| Power output:               | 20mW max per channel                   |
| Dimensions:                 | 3" W x 5½" H x 11/16 " D               |

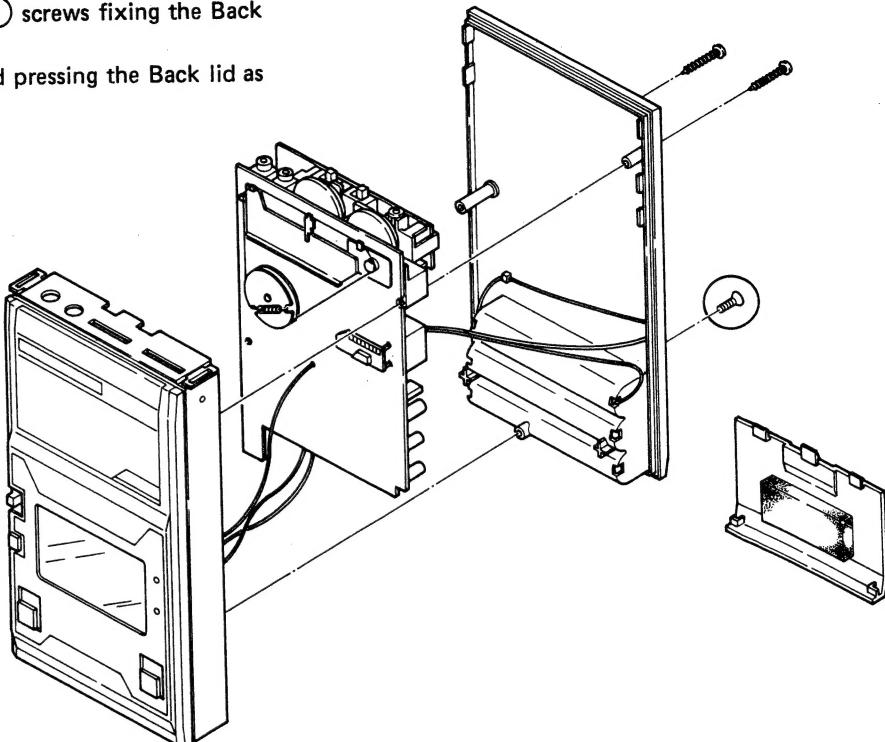
\* Specifications are subject to change without notice.

WM-9627  
*ki*

## HOW TO DETACH THE CABINET AND PRINTED CIRCUIT BOARD

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1. Unscrew 2 Tapping screws and ① screws fixing the Back lid.
2. Detach the Cabinet by pulling and pressing the Back lid as shown figure.



## PARTS LIST

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| Key. No.       | Part No.         | Description                          | Q'ty |
|----------------|------------------|--------------------------------------|------|
| <b>PACKING</b> |                  |                                      |      |
|                | 141-6-141T-17907 | Display Carton, Set (for except USA) | 1    |
|                | 141-6-141T-17906 | Display Carton, Set (for USA)        | 1    |
|                | 141-6-144T-88600 | Foam Plastic Case, Set               | 1    |
|                | 141-6-317T-59500 | Pad                                  | 1    |
|                | 141-0-176T-06900 | Band Ass'y                           | 1    |
|                | 141-6-231T-15200 | Inner Polye Cover, Set               | 1    |
|                | 141-6-231T-20201 | Inner Polye Cover, Headphone         | 1    |
|                | 4-152T-04801     | Head Phone Ass'y                     | 1    |
|                |                  |                                      | 1    |

### CABINET ASS'Y WITH GAME

|  |                  |                                    |   |
|--|------------------|------------------------------------|---|
|  | 141-0-111T-56720 | Cabinet Ass'y, with Game           | 1 |
|  | 141-2-131T-41100 | Clear Window                       | 1 |
|  | 141-2-160T-26100 | Push Button, Right, Left           | 2 |
|  | 141-2-160T-26200 | Push Button, Acl, Set              | 2 |
|  | 141-2-160T-26300 | Push Button, Time, Game 1,2        | 1 |
|  | 141-2-164T-32600 | Slide Knob, Sound, Off             | 1 |
|  | 141-2-382T-20900 | Terminal, Sound, Off               | 1 |
|  | 141-2-447T-84600 | Cushion, LCD                       | 1 |
|  | 4-231T-96600     | Key Board Switch                   | 5 |
|  | 4-400T-04300     | Connector                          | 2 |
|  | 141-2-322T-78400 | Shield Plate, LCD                  | 1 |
|  | 141-2-322T-78300 | Shield Plate, LCD PCB              | 1 |
|  | 141-4-250T-89400 | P. C. Board                        | 1 |
|  | 4-970T-00900     | L. C. D                            | 1 |
|  | 4-151T-40574     | Speaker                            | 1 |
|  |                  | Special Pan. Hd. 1B Tapping        | 6 |
|  |                  | Screw 2 x 6mm                      |   |
|  | 141-2-247T-17500 | Sheet                              | 1 |
|  | 141-2-327T-28500 | Insulator                          | 1 |
|  | 141-2-327T-29300 | Insulator, For Shield Plate (T783) | 1 |
|  | 141-2-322T-79400 | Shield Plate, Right                | 1 |
|  | 141-2-322T-79500 | Shield Plate, Left                 | 1 |
|  | 4-151T-42974     | Speaker                            | 1 |

| Key. No.                     | Part No.         | Description                  | Q'ty |
|------------------------------|------------------|------------------------------|------|
| <b>CABINET &amp; CHASSIS</b> |                  |                              |      |
|                              | 141-0-126T-43200 | Back Lid Ass'y               | 1    |
|                              | 141-0-128T-20400 | Battery Lid Ass'y            | 1    |
|                              | 141-2-178T-04701 | Bracket Band                 | 2    |
|                              | 141-2-311T-43400 | Chassis                      | 1    |
|                              | 141-2-210T-44100 | Bracket, Chassi              | 1    |
|                              | 141-2-163T-93200 | Rotary Knob, Volume          | 1    |
|                              | 141-2-163T-93300 | Rotary Knob, Tuner           | 1    |
|                              | 141-0-164T-31802 | Slide Knob Ass'y, Band Swith | 1    |
|                              | 141-2-538T-14600 | Drum                         | 1    |
|                              | 141-2-511T-25600 | Pointer                      | 1    |
|                              | 141-2-566T-13800 | Tuning Shaft                 | 1    |
|                              | 141-2-571T-22200 | Bracket, Bearing Axis        | 1    |
|                              | 141-2-856T-12300 | Spring Coil, Rope            | 1    |
|                              | 141-2-340T-02530 | Rope, 450mm                  | 1    |

### FIXING PARTS

|  |                  |  |   |
|--|------------------|--|---|
|  | 141-2-421T-40300 | Special Screw, Back Lid<br>Flat Hd. Tapping Screw<br>2.6 x 8mm, Back Lid | 2 |
|  |                  | Special Pan. Hd. 1 Screw<br>1.7 x 5mm. Bracket Band                      | 4 |
|  |                  | Special Pan. Hd. 3 Screw<br>1.7 x 3mm, Duram, Tuner                      | 2 |
|  |                  | Special Pan. Hd. 1B Tapping<br>Screw 1.7 x 5mm, Bracket-PCB              | 2 |
|  |                  | Bracket/switch PCB   |   |
|  |                  | Special Pan. Hd. 1 Screw<br>1.7 x 5mm, Volume                            | 1 |
|  | 141-2-415T-02400 | Hexgon Nut, Tuner  | 1 |
|  | 141-2-457T-23600 | Special Washer, Tuner  | 1 |
|  | 141-2-457T-42000 | Special Washer, Tuner, Volume  | 2 |

PARTS LIST

| Key. No.   | Part No.                 | Description                    | Q'ty | Key. No.                     | Part No.  | Description  | Q'ty |
|--|--------------------------|--------------------------------|------|------------------------------|---|--|------|
| MAIN P. C. B. ASS'Y  |                          |                                |      | MAIN P. C. B. ASS'Y          |   |  |      |
| L102   | 1414-250T-75904          | P.C.B. Ass'y, Main             | 1    | C306                         | CAPACITORS                                      | Electrolytic 220 $\mu$ F   | 6.3V |
|  | 4-224T-22500             | Variable Capacitor             | 1    | C308,311                     |   | Electrolytic 4.7 $\mu$ F   | 25V  |
| L103   | 4-253T-13471             | Filter, FM BPF                 | 1    | C309                         |   | Electrolytic 0.1 $\mu$ F   | 50V  |
| L104   | 4-265T-08600             | V. H. F Coil                   | 1    | C315                         |   | Electrolytic 22 $\mu$ F  | 10V  |
| L105   | 4-265T-08700             | V. H. F Coil                   | 1    | C317,702,<br>902,705,<br>905 |   | Electrolytic 100 $\mu$ F   | 6.3V |
| L106   | 4-265R-12500             | V. H. F Coil                   | 1    | C501                         |   | Electrolytic 4.7 $\mu$ F   | 25V  |
| T301   | 4-257T-52300             | Antenna Coil                   | 1    | C504                         |   | Electrolytic 1 $\mu$ F   | 50V  |
| T303   | 4-258T-40210             | O. S. C Coil                   | 1    | C505                         |   | Electrolytic 0.47 $\mu$ F  | 50V  |
| T304   | 4-256T-28210             | I. F. T                        | 1    | C506,507                     |   | Electrolytic 2.2 $\mu$ F   | 50V  |
|  | 4-256T-28310             | I. F. T                        | 1    | C510,511                     |   | Electrolytic 0.1 $\mu$ F   | 50V  |
|  | 4-256T-28410             | I. F. T                        | 1    | C706                         |   | Electrolytic 220 $\mu$ F   | 6.3V |
|  | 4-256T-86000             | IF Filter, 10.70M Red          |      | C701,901                     |   | Electrolytic 1 $\mu$ F   | 50V  |
|  | 4-256T-86071             | IF Filter, 10.67M Blue         |      | C503                         |   | P P Con 1000pF $\pm$ 5%  | 100V |
| CF301,302  | 4-256T-86072             | IF Filter, 10M73M Orange       | or 2 | C114                         |   | Electrolytic 4.7 $\mu$ F   | 10V  |
|  | 4-256T-86703             | IF Filter, 10.64M Black        |      | C313                         |   | Capacitor 220 $\mu$ F  | 6.3V |
|  | 4-256T-86074             | IF Filter, 10.76M White        |      | C101,110,<br>112             |   | Ceramic 0.022 $\mu$ F +80-20% 50V  | 3    |
| CF303  | 4-256T-81100             | IF Filter, 455KHz              | 1    | C102,103,<br>109,116,<br>314 |   | Ceramic 0.01 $\mu$ F +80-20% 50V   | 5    |
| T302   | 4-256T-22910             | I F T                          | 1    | C104,301,<br>302,303,<br>304 |   | BC Con 0.022 $\mu$ F $\pm$ 10% 25V   | 5    |
| S101   | 4-238T-59800             | Switch,3p                      | 1    | C105                         |   | Ceramic 18pF $\pm$ 5% 50V  | 1    |
| VR701,901  | 4-220T-06500             | Variable Resistor              | 1    | C106                         |   | Ceramic 7pF $\pm$ 0.25pF 50V   | 1    |
| SVR501   | 4-222T-75075             | Semi-Variable Resistor 10K ohm | 1    | C107                         |   | Ceramic 30pF $\pm$ 5% 50V  | 1    |
| L301   | 4-240T-30300             | Socket                         | 2    | C108                         |   | Ceramic 330pF $\pm$ 10% 50V  | 1    |
| L107,108   | 4-253T-14823             | Filter                         | 1    | C117                         |   | BC Con 0.01 $\mu$ F $\pm$ 10% 25V  | 1    |
| L109   | 4-253T-14812             | Filter                         | 2    | C312,316                     |   | Ceramic 220pF $\pm$ 10% 50V  | 2    |
| L302   | 4-253T-14819             | Filter                         | 1    | C310,514,<br>515             |   | BC Con 0.047 $\mu$ F $\pm$ 10% 25V   | 3    |
| IC301  | 4-253T-14836             | Filter                         | 1    | C502                         |   | BC Con 0.022 $\mu$ F $\pm$ 10% 25V   | 1    |
| IC501  | IC $\mu$ PC1222C         |                                | 1    | C509,508                     |   | BC Con 0.015 $\mu$ F $\pm$ 10% 25V   | 2    |
| Q101   | IC LA3365                |                                | 1    | C512,513                     |   | Ceramic 0.0033 $\mu$ F $\pm$ 10% 50V   | 2    |
| Q102   | Transistor 2SC2787       |                                | 1    | C703,903,<br>707,907         |   | Ceramic 0.0033 $\mu$ F $\pm$ 10% 50V   | 4    |
| Q701,901   | Transistor 2SC2787       |                                | 1    | C704,904                     |   | Ceramic 0.01 $\mu$ F +80-20% 50V   | 2    |
| Q702,902   | Transistor 2SC2785       |                                | 2    | C100,307                     |   | Ceramic 100pF $\pm$ 10% 50V  | 2    |
| Q703,903   | Transistor 2SC2785       |                                | 2    | C120                         |   | Ceramic 20pF $\pm$ 10% 50V   | 1    |
| Q501   | Transistor 2SA733        |                                | 2    | C111                         |   | Ceramic 10pF $\pm$ 5% 50V  | 1    |
| Q103   | Transistor 2SC2785       |                                | 1    | C113                         |   | Ceramic 15pF $\pm$ 5% 50V  | 1    |
| D101,102,  | Transistor 2SK193        |                                | 1    | C118                         |   | Ceramic 0.001 $\mu$ F $\pm$ 20% 50V  | 1    |
| 104,106,   | Diode 1S2473             |                                | 6    | C115                         |   | Ceramic 4pF $\pm$ 0.25pF 50V   | 1    |
| 702,902  |                          |                                |      | C121                         |   | Ceramic 2pF $\pm$ 0.25pF 50V   | 1    |
| D103   | Varistor VD1221M         |                                | 1    | C708                         |   | Ceramic 0.001 $\mu$ F $\pm$ 20% 50V  | 1    |
| D701,901   | Varistor VD1222L         |                                | 2    |                              |   |  |      |
| RESISTORS<br>All Resistors are Carbon V-type $\pm$ 10% 1/4W, unless otherwise noted. |                          |                                |      | SWITCH P. C. B. ASS'Y        |   |  |      |
| R101,103,<br>104,505   | 1K ohm, $\pm$ 5%, 1/6W   |                                | 4    | S102,103                     | 1414-250T-89600<br>4-238T-64900<br>4-238T-52900 | P.C.B. Ass'y, Switch<br>or Switch, 2p  | 1    |
| R102   | 120K ohm, $\pm$ 5%, 1/6W |                                | 1    | Q704                         |   | Transistor 2SA1175   | 1    |
| R105   | 3.3K ohm, $\pm$ 5%, 1/6W |                                | 1    | D501                         |   | LED SLP114B Red  | 1    |
| R106   | 820 ohm                  |                                | 1    | D704                         |   | Zener Diode RD3.6E L1  | 1    |
| R107   | 47 ohm                   |                                | 1    | D703                         |   | Diode 1SS53  | 1    |
| R108,309   | 56 ohm                   |                                | 2    |                              |   |  |      |
| R109   | 56 ohm, 1/8W             |                                | 1    | R507                         |   | RESISTORS<br>All Resistors are Carbon V-type $\pm$ 10% 1/4W, unless otherwise noted. |      |
| R110   | 1.8K ohm, 1/8W           |                                | 1    | R707                         |   | 470 ohm, P-type  | 1    |
| R111   | 330 ohm                  |                                | 1    | R708                         |   | 270 ohm, 1/6W  | 1    |
| R112   | 470 ohm                  |                                | 1    |                              |   | 15K ohm, 1/6W  | 1    |
| R302   | 560 ohm                  |                                | 1    |                              |   |  |      |
| R303   | 330 ohm                  |                                | 1    |                              |   |  |      |
| R304   | 10K ohm                  |                                | 1    |                              |   |  |      |
| R305   | 560 ohm                  |                                | 1    |                              |   |  |      |
| R306   | 4.7K ohm                 |                                | 1    |                              |   |  |      |
| R307   | 2.2K ohm                 |                                | 1    |                              |   |  |      |
| R308   | 10K ohm                  |                                | 1    |                              |   |  |      |
| R501   | 33K ohm                  |                                | 1    |                              |   |  |      |
| R502   | 680K ohm                 |                                | 1    |                              |   |  |      |
| R503   | 1K ohm                   |                                | 1    |                              |   |  |      |
| R706   | 220 ohm                  |                                | 1    |                              |   |  |      |
| R906   | 5.6 ohm                  |                                | 1    |                              |   |  |      |
| R705,905   | 5.6 ohm, $\pm$ 5%, 1/6W  |                                | 1    |                              |   |  |      |
| R704,904   | 10 ohm                   |                                | 2    |                              |   |  |      |
| R315   | 22 ohm                   |                                | 2    |                              |   |  |      |
| R504   | 120 ohm                  |                                | 1    |                              |   |  |      |
| R506   | 6.8K ohm                 |                                | 1    |                              |   |  |      |
| R508   | 470 ohm                  |                                | 1    |                              |   |  |      |
| R509,511   | 560 ohm                  |                                | 1    |                              |   |  |      |
| R510,512   | 3.3K ohm                 |                                | 2    |                              |   |  |      |
| R701,901   | 1K ohm                   |                                | 2    |                              |   |  |      |
| R702,703,<br>902,903   | 100K ohm                 |                                | 2    |                              |   |  |      |
| R515   | 180 ohm                  |                                | 4    |                              |   |  |      |
|  | 100 ohm                  |                                | 1    |                              |   |  |      |

## TUNER ADJUSTMENT

### MW ADJUSTMENT

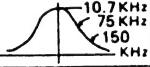
Set the DC4.5 Speaker Impedance is 32 ohms

| Step | Adjusting Circuit  | Connections                          |   | SG Frequency                     | Position of tuning dial                                     | Adjustment | VTVM Oscilloscope |
|------|--------------------|--------------------------------------|---|----------------------------------|---|------------|-------------------|
|      |                    | Input                                | Output                                    |                                  |   |            |                   |
| 1    | I.F.T.             | Connect sweep generator to Test Loop | Connect oscilloscope to R306(H) & TP-6(E) | 455 KHz<br>470 KHz (UK)          | Low end of dial scale.<br>At position of unrequired signal. | T303, T302 | MAX.              |
| 2    | OSC                | Connect AM SG to Test Loop           | Connect VTVM to speaker terminals.        | 517 KHz (400 Hz 30% modulation)  | Low end of dial scale                                       | L106       | MAX               |
| 3    |                    |                                      |   | 1650 KHz (400 Hz 30% modulation) | High end of dial scale                                      | VCT-4      |                   |
| 4    | ANT.               | Connect AM SG to Test Loop           | Connect VTVM to speaker terminals.        | 600 KHz (400 Hz 30% modulation)  | 600 KHz on dial scale                                       | L105       | MAX               |
| 5    |                    |                                      |   | 1400 KHz (400 Hz 30% modulation) | 1400 KHz on dial scale                                      | VCT-3      |                   |
| 6    | Repeat adjustments |                                      |   |                                  |   |            |                   |

- PREPARE: 1. Set the dial pointer to very left line of dial scale.  
 2. Connect sweep generator, AM SG, VTVM and oscilloscope.

3. Selector switch to "MW"  
 4. Use a screwdriver with plastic grip for all adjustments.

### FM ADJUSTMENT

| Step | Adjusting Circuit   | Connections                                     |   | SG freqiemcu                     | Position of tuning dial                                       | Adjustment | VTVM Oscilloscope   |
|------|---------------------|---|---|----------------------------------|---|------------|---|
|      |                     | Input   | Output                                      |                                  |   |            |   |
| 1    | I.F.                | Connect sweep generator to TP-4 (H) & TP-6 (E)  | Connect oscilloscope to TP-4 (H) & TP-6 (E) | 10.7 MHz (0% modulation)         | Near max. capacity of VC. at position with unrequired signal. | T301       |  |
| 2    |                     |   | Connect oscilloscope to TP-4(H) & TP-6(E)   |                                  |   | T304       |   |
| 3    | O.S.C.              | Connect FM SG. to test point TP-1(H) & TP-2 (E) | Connect VTVM to Speaker terminal.           | 87 MHz (400 Hz 30% modulation)   | Low end of dial scale   | L103       | MAX.  |
| 4    |                     |   |   | 109 MHz (400 Hz 30 % modulation) | High end of dial scale  | VCT-2      |   |
| 5    | ANT.                | Connect FM SG. to test point TP-1(H) & TP-2 (E) | Connect VTVM to speaker terminal            | 90 MHz (400 Hz 30% modulation)   | 90.0 MHz on dial scale  | L102       | MAX.  |
| 6    |                     |   |   | 106 MHz (400 Hz 30 modulations)  | 106.MHz on dial scale   | VCT-1      |   |
| 7    | Repeat adjustments. |   |   |                                  |   |            |   |

- PREPARE: 1. Set the dial pointer to very left line of dial scale.  
 2. Connect sweep generator, FM SG, VTVM and oscilloscope.  
 3. Use a screwdriver with plastic grip for all adjustments.  
 4. Use a FM antenna dummy impedance is 75 ohm.

### ADJUSTMENT OF FM MULTIPLEX

This adjustment should be done after adjustment of FM tuner.

Carrier signal modulation frequency: 1000 Hz ±22.5kHz dev. (30% Modulation)

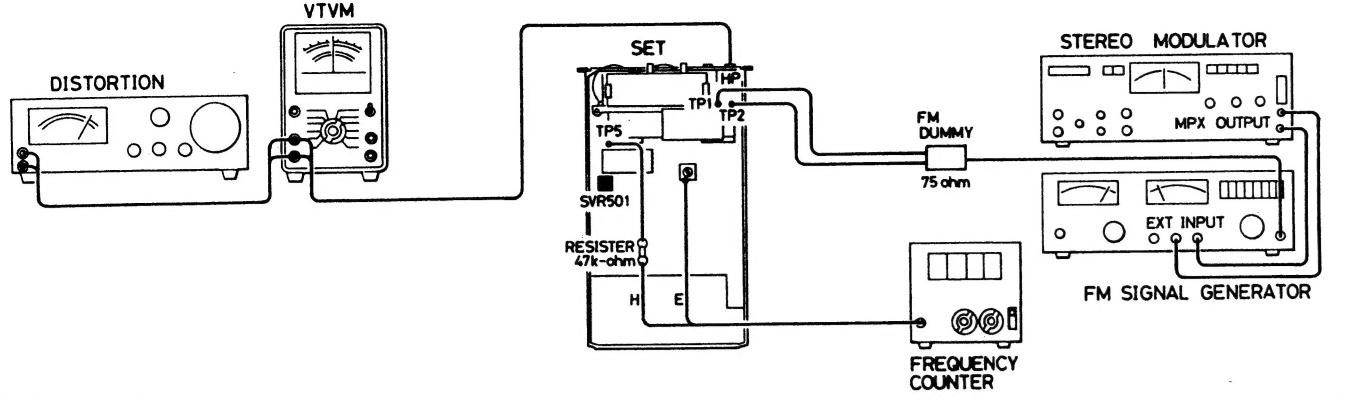
Pilot signal (19 kHz): ±7.5kHz dev. (10% Modulation)

| Adjustment   | Tuning frequency | Connection method of instruments |   | Freq. of sig. gen. | Adj. point | Traget value   | Method of adjustment  |
|--------------|------------------|----------------------------------|---|--------------------|------------|----------------|---|
|              |                  | Input side                       | Output side   |                    |            |                |   |
| VCO (19 kHz) | 98 MHz           |                                  | Connect hot side of freq. counter to TP-5 earth side to IFT Case. | 98 MHz             | SVR501     | 19 kHz ±100 Hz | (1) In FM stereo mode, set output of FM-SG to 60 dB, and tune in.<br>(2) * Adjust with no modulation.   |
| Separation   |                  |                                  | Connect hot side of FM-SG to TP1, earth side to TP2.              |                    |            |                | (1) In FM stereo mode, set FM-SG to 60 dB, and tune in.<br>(2) With tone controls at MIN and balance control in the center, adjust volume control to standard output.<br>(3) By changing over the channels* on stereo modulator, adjust the leakage current of opposite channel to minimum. |

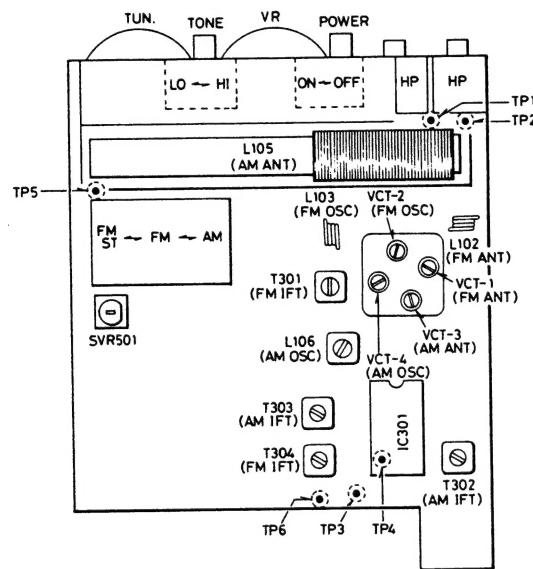
\* "No modulation" means to set MAIN & SUB signal and PILOT signal of stereo modulator to "OFF" position.

\* When changing over the channels, exchange the connections of the external speaker terminals at the same time.

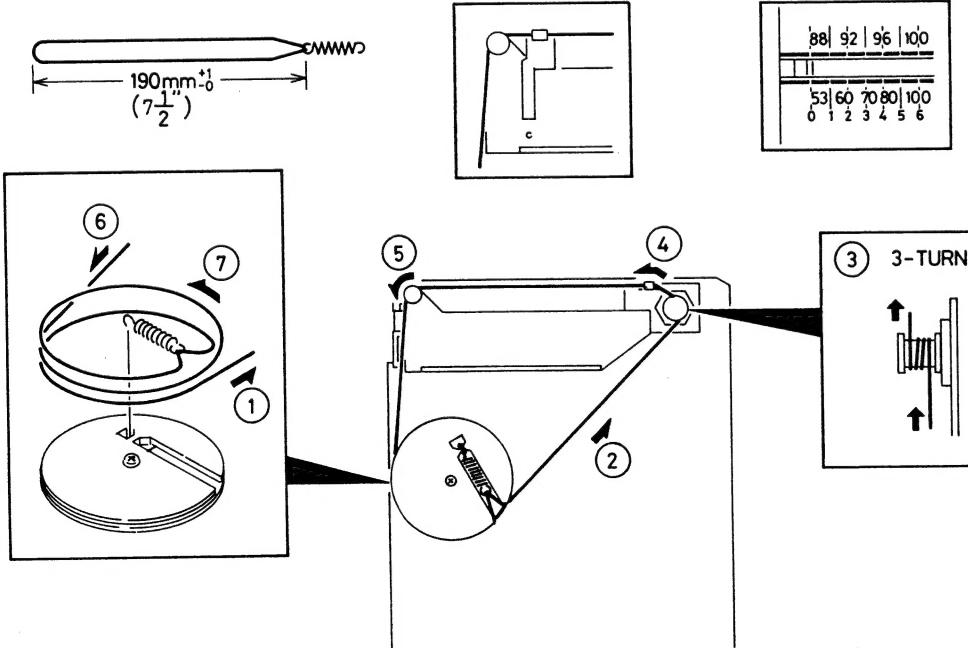
## ADJUSTMENT



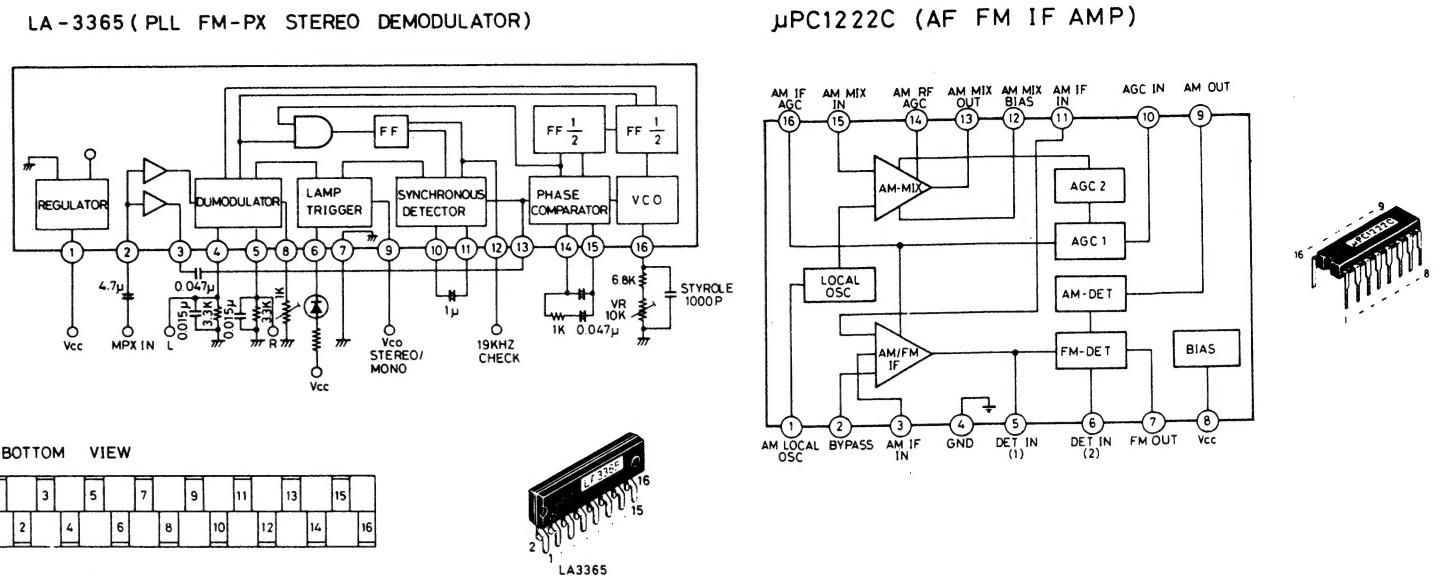
## PART LOCATION



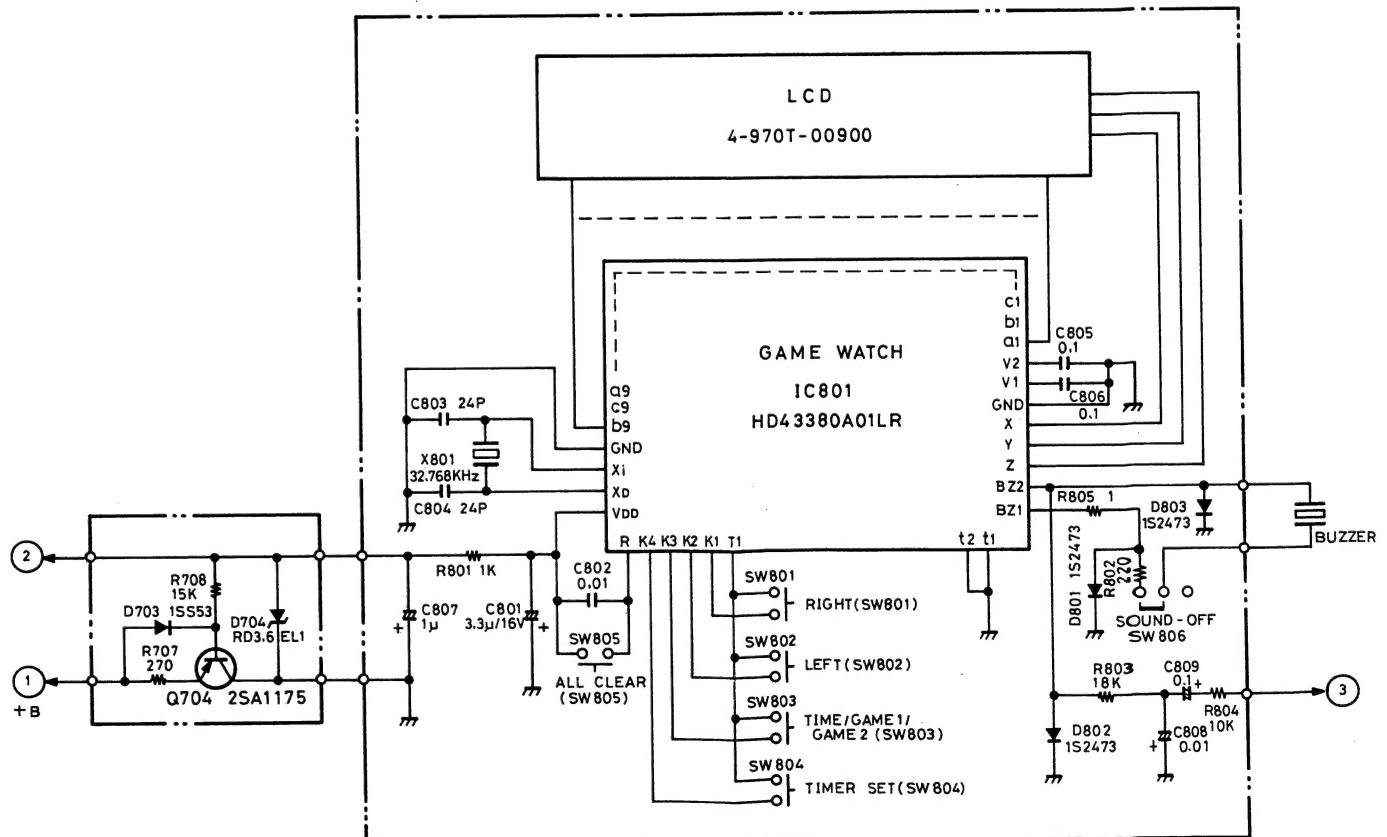
## DIAL CORD STRINGING



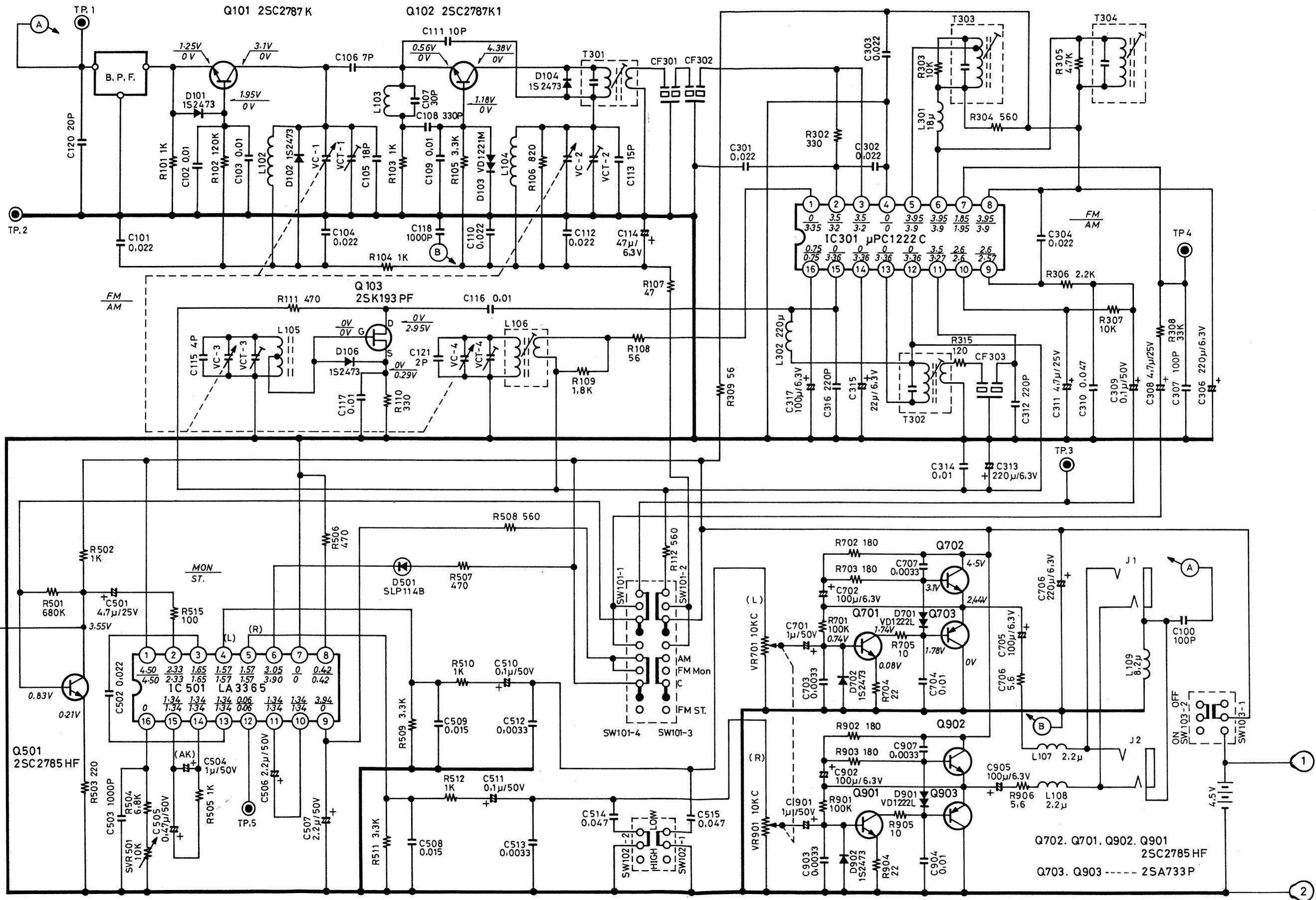
## IC BLOCK DAIGRAM



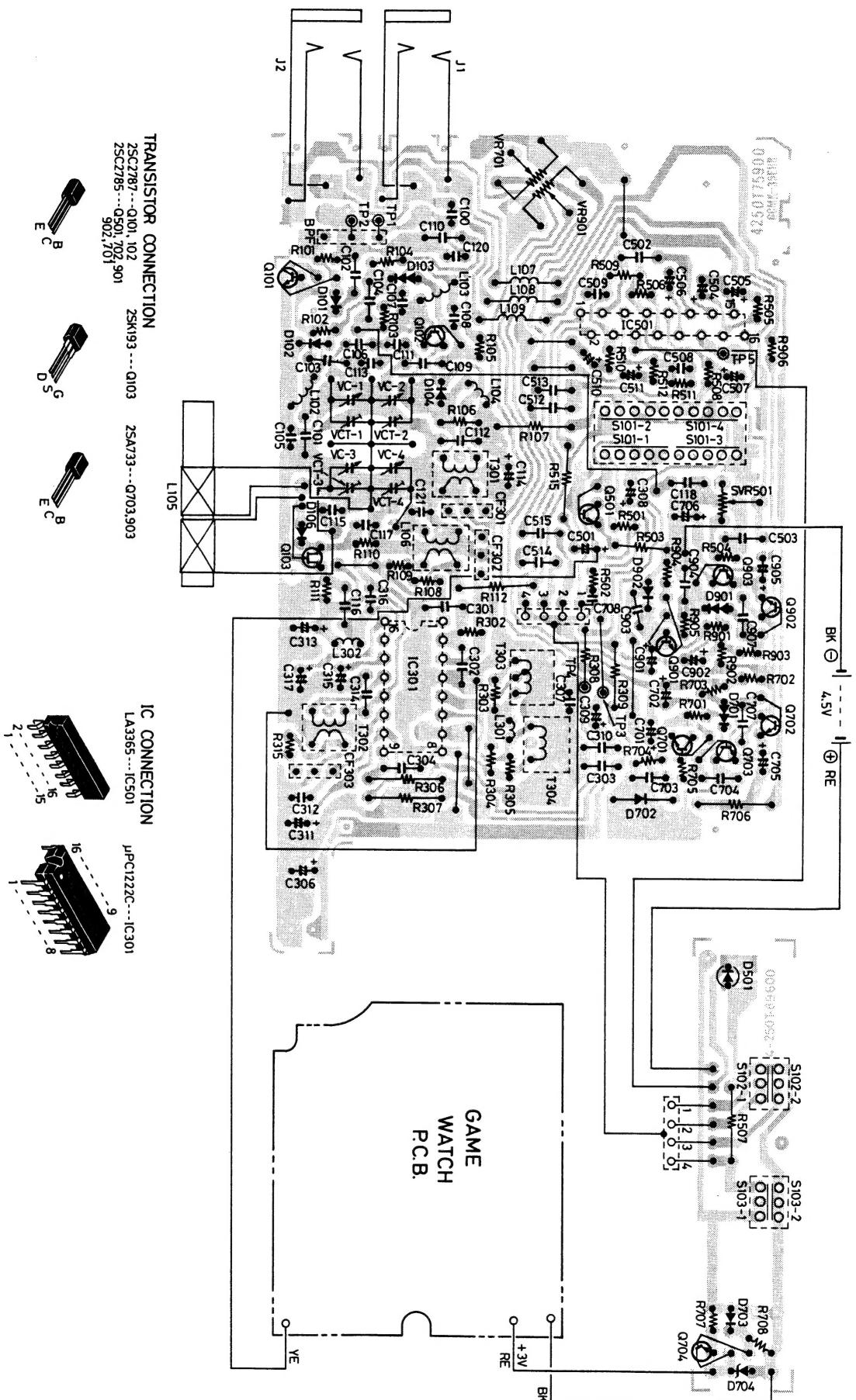
## GAME WATCH & SWITCH PCB SCHEMATIC DAIGRAM



SCHEMATIC DAIGRAM

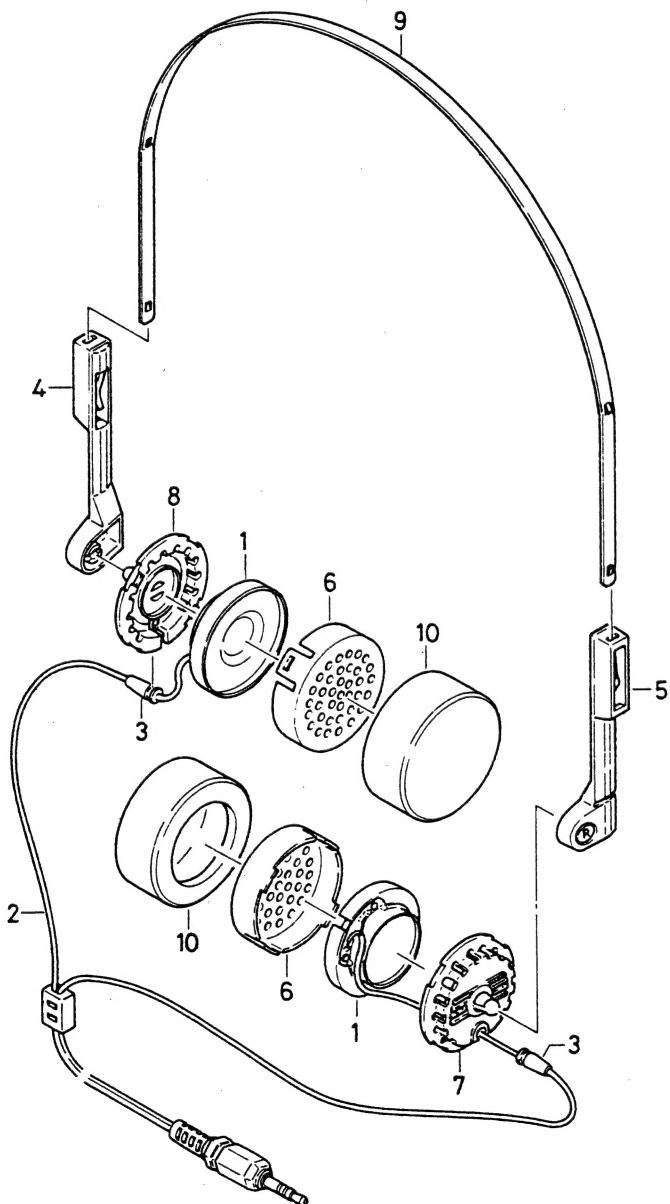


## WIRING DAIGRAM



PARTS LIST & EXPLOVIDED VIEW

| Key. No.                  | Part No.   | Description  | Q'ty |
|---------------------------|--|--|------|
| HEAD PHONE P. C. B. ASS'Y |  |  |      |
| 1                         | 4-151T-43900<br>4-243T-23700<br>4-243T-23771<br>4-243T-25471<br>4-243T-23772<br>4-243T-26300 | Speaker<br>Lead Cord<br>Lead Cord<br>Lead Cord<br>Lead Cord<br>Lead Cord | 2    |
| 2                         |  |  | 1    |
| 3                         | 141-2-743T-08201   | Arm, Right   | 1    |
| 4                         | 141-2-743T-08101   | Arm, Left  | 1    |
| 6                         | 141-2-210T-44800   | Bracket  | 2    |
| 7                         | 141-2-210T-44900   | Bracket  | 1    |
| 8                         | 141-2-210T-44901   | Bracket  | 1    |
| 9                         | 141-2-172T-03400   | Hanger   | 1    |
| 10                        | 141-2-180T-00300   | Ear Pad  | 2    |



SANYO ELECTRIC INC.,  
SANYO ELECTRIC TRADING CO., LTD